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JULY 20, 1925 Issued Weekly PRICE 10 CENTS

The Three Loening Planes Leaving for the Arctic

VOLUME XIX

NUMBER 3

SPECIAL FEATURES

THE PANDER LIGHT PLANE

NOBILE AIRSHIP LANDING SYSTEM

WHAT REALLY HAPPENED IN HAWAIIAN MANEUVERS

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1915-1925

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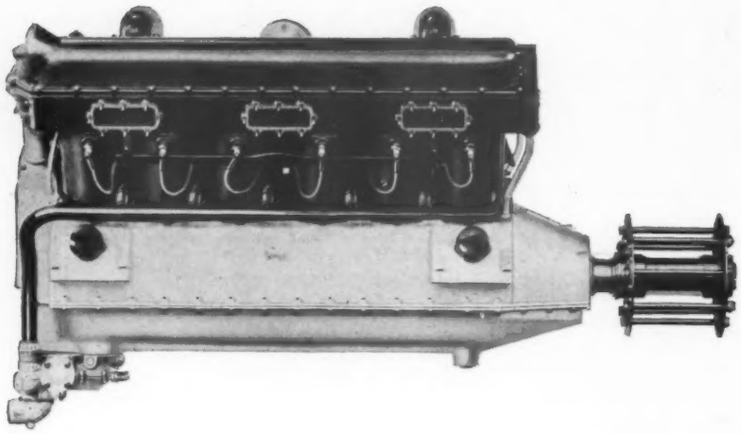

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JULY 20, 1925

AVIATION

VOL. XIX. NO. 3

Published every Monday

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VOL. XIX JULY 20, 1925 No. 3

Bombing With 80 Per Cent Hits

SPECIAL attention should be given to the letter of Capt. Norbert Carolin, printed elsewhere in this issue. Captain Carolin has probably had more experience as a bombing pilot than any officer in the world. He is out of the service now and it is refreshing to hear an ex-officer give his frank opinions without fear of discipline.

His statement that any bombing team that cannot register 80 per cent hits on such an objective (a battleship) from 9,000 feet should be returned to school for further training," is of prime significance. This letter should be shown to President Coolidge and compared with the statements made by the General Board of the Navy as to the percentages of hits. As Captain Carolin has dropped 300,000 pounds of bombs himself, his claim deserves the highest regard.

A captain in the Navy by the name of Simms once wrote a letter to President Roosevelt making similar remarks about shooting in the Navy. He was put in charge of naval gunnery and made a world-wide reputation. If Captain Carolin could have a similar opportunity with both the Army and Navy bombing many of the misstatements would be given the lie as they should be. A clearer or better statement on what may be expected from bombing was never written.

Tow Boats for the Coast Artillery

IF any duty is irksome it is to be compelled to act as a brainless target for a prearranged shooting match. And that is the basis of the irritation that is under the surface of the Air Service this Summer. Instead of conducting tests of bombing and formation flying, the main purpose of the Air Service appears to be towing targets at stated altitudes and speeds to give the Coast Artillery a chance to prove to Congress that some of their claims are worthy of belief.

As a matter of fact the Coast Artillery is fighting for its life. Its usefulness is rapidly becoming as obsolete as cavalry and in order to clutch at a straw it has grabbed anti-aircraft as a life-saver. The Army has not been enthusiastic over the rapidly growing Air Service and clings to the older branches with a tenacity that is historic. It is therefore not unnatural for orders to be issued that the Army airplanes should act as towers of sleeves for the anti-aircraft guns to practice upon.

If the airmen were given a chance to dive, slip and zoom they would gladly enter into the tests, but to become mere mechanical circuit riders, with their positions fixed in advance, is neither the duty nor the obligation of an officer. But orders are orders.

A New Trade

INQUIRIES are continually made by young men as to how they can get work in the aeronautical field. These requests for information have been hard to answer, but there is one new field which might be of interest to certain men and where there is, at present, a shortage of skilled labor. This work is the constructing and building of metal planes and especially of duraluminum hulls and floats. There is little doubt that, in the future, seaplane hulls will be made almost exclusively of metal. If properly worked, metal construction is lighter and stronger than wood and does not absorb any water. The present obstacles to its wider use are the high cost, the lack of knowledge of the properties, and the methods of working light alloys.

Manufacturers of wooden planes have been able to secure carpenters and cabinet makers as their skilled workers but even these men are much more valuable when they have been trained in aircraft manufacture.

There is no source from which skilled workers can be drawn for the working of light metals. In fact, the aeronautical industry is developing a light metal technique that other industries will draw on for their work. The man skilled in the working of light alloys has a great opportunity before him. His knowledge, if gained from experience, will be unique, and already there is a demand for his services. Within a month we have heard of four places where experimental work is being done with light alloys, and in each case there had been difficulty in getting experienced men to do this class of work. Those men wishing to make aviation their life work, will do well to keep this development in mind.

Poverty-stricken Terminology

SINCE the War there has been a general tendency in aeronautical circles to become careless as to the nomenclature of flying. We hear of "landing on the water." Airplanes, seaplanes, flying boats and airships are indiscriminately called "ships" which is undoubtably the most insidious word that has afflicted any art. The old "lighter-than-air" and "heavier-than-air" expressions have crawled clumsily through the columns of air news. The objectionable "birdman" is nearly dead except in newspaper circles and among a few choice spirits that make merry in the neighborhood of Greenwich Village. "Game" is also another word that has almost gone.

The purist in words is about as tiresome to follow as the aviation enthusiast with a hobby, but there is no necessity of being an extremist, to create a respect for an art or science. Take a few simple examples. Airplanes *land* on flying fields; Seaplanes *alight* on water. Ships are water craft and only an impoverished vocabulary needs it in place of the equally short *plane* which is an air word. Why the word *aerostation* has not come into general use is difficult to understand. *Aviation* has certainly supplanted heavier-than-air. Why not *aerostation* for lighter-than-air? So far as this publication is concerned we shall try to do all that is possible to make it more popular. With the types of aerostats becoming more diversified a general term is needed and there is no better place to start a change than in the flier's own paper.

National Air Races at Mitchel Field

The National Air Races will be held at Mitchel Field, Long Island, on Oct. 8, 9 and 10, according to an announcement made July 12 by E. O. McDonnell, president of the New York 1925 Air Races, Inc., No. 30 East 42nd St., the organization under whose auspices this premier flying event will be held.

Permission for the use of Mitchel Field has been given by Acting Secretary of War Dwight F. Davis, who stated in his letter to Mr. McDonnell: "The Army Air Service will participate in the International Air Races this year and will cooperate with your association in every way possible with a view to making the occasion a complete success."

Maj. Gen. Charles P. Summerall, commanding officer of the Second Corps Area, has also expressed approval of the use of the field for the races and pledged full support and the aid of Col. T. A. Baldwin, air officer of this Corps Area, and Maj. William N. Hensley, commanding officer of Mitchel Field. Maj. Gen. Mason M. Patrick, Chief of Air Service, U.S.A., and Rear Admiral W. A. Moffett, Chief of the Bureau of Aeronautics, U.S.N., have promised entries in all military races.

The race for the Pulitzer Trophy, now held by Lieut. Al Williams, U. S. Naval Air Service, will take place on Oct. 10. There will probably be four contestants and members of the committee are confident that the present high speed mark for this race of 243 mi./hr. made by Lieutenant Williams in St. Louis in 1923 will be bettered with the new planes, which are now being built by the Curtiss company at Garden City, L. I.

The personnel of the general racing committee is as follows: Vincent Astor, Robert L. Bacon, Harold Bolster, Caleb S. Bragg, E. Garnsey Brownell, Irving T. Bush, Godfrey Cabot, B. F. Castle, Heyward Cutting, Gerhard M. Dahl, T. Coleman Dupont, Harold Fowler, Harvey D. Gibson, Harry F. Guggenheim, Frank Hitchcock, Richard F. Hoyt, Leonard Kennedy, Clarence Mackay, Edward O. McDonnell, A. G. McIlwaine, Jr., Orson D. Munn, Grayson M. P. Murphy, Bradford Norman, Jr., Earl D. Osborn, A. C. Pickford, Johnson Redmond, Gov. Alfred E. Smith, Lorillard Spencer, Elmer A. Sperry, James B. Taylor, Jr., Frank A. Tichenor, James P. Warburg, Henry James White, C. V. Whitney and Maj. W. L. Hensley, Air Service U.S.A.

All the foreign governments have been invited to participate in the races and there is a chance that foreign entries may be made. Two other entries which may be made in the Pulitzer race, are a fast PW8 pursuit plane of the Army and the Curtiss Navy racer in which Lieutenant Williams made his record at St. Louis.

Altogether prizes of $23,500 will be awarded in all of the different events. These events and the dates on which they will be held are as follows:

1. *Sept. 28 to Oct. 8*—"On-to-New York" race for *New York Chapter National Aeronautic Association Trophy (Civilians only)*. Race based on distance covered, passengers carried, engine horsepower and average speed. Prizes $3000.
2. *Thursday, Oct. 8, 11 a. m.*—Free-for-all race for two seater airplanes, engine piston displacement 510 cu. in. or less; required load 340 lb.; distance 100 mi., 20 times around a closed course of 5 mi. (*Civilians only*). Prizes $2500.
3. *Thursday, Oct. 8, 12:30 p. m.*—Free-for-all race for 2, 3 or 4 place airplanes, engine piston displacement 800 cu. in. or less; required load 340 lb.; distance 100 mi., 20 times around a closed course of 5 mi. (*Civilians only*). Prizes $2500.
4. *Thursday, Oct. 8, 3:30 p. m.*—Race for observation type (2 place) airplanes for *Liberty Engine Builders Trophy.* Required air speed greater than 90 mi./hr., total wing area greater than 290 sq. ft. Contest based on formula: $\frac{400}{1649} \times$ cubic inch displacement of engine used $\times$ 0.85 plus crew load 340 lb. Distance 180 mi., 15 times around a closed course of 12 mi. (*Military*). Prizes $2500.
5. *Friday, Oct. 9, 9:30 a. m.*—Duration race for *Mulvihill Trophy* (*Members Junior Flying League National Aeronautic Association*) Prizes $500.
6. *Friday, Oct. 9, 10:45 a. m.*—Light Commercial Speed and Efficiency Race for *Aviation Town and Country Club of Detroit Trophy.* Required air speed greater than 80 mi./hr., distance 100 mi., twenty times around a closed course of 5 mi., winner (a) on speed, (b) on efficiency, latter on formula as follows: w x mi./hr. (*Civilians only*). Prizes $2500.
7. *Friday, Oct. 9, 1:00 p. m.*—Light Airplane Race for *Dayton Daily News Trophy,* engine piston displacement 80 cu. in. or less. Distance 50 mi., 10 times around a closed course of 5 mi. (*Civilians only*). Prizes $2000.
8. *Friday, Oct. 9, 2:30 p. m.*—Race for large capacity airplanes for *Detroit News Air Transport Trophy.* Required air speed greater than 85 mi./hr.; total wing area greater than 600 sq. ft.; capable of carrying pay load of 2000 lb. or for contest load on following formula: $\frac{400}{1649} \times$ cubic inch displacement of engine or engines used $\times$ 2. Distance 120 mi., 10 times around a closed course of 12 mi. (*military*) prizes $2000.
9. *Saturday, Oct. 10, 12:00 M*—Speed and efficiency race for light airplanes, engine piston displacement 80 cu. in. or less. Winner (a) on speed, (b) on efficiency on following formula: $\frac{\text{Speed of completing race in mi./hr.}}{\text{Gasoline consumed}}$ Distance 50 mi., ten times on closed course of 5 mi. (*civilians only*). Prizes $2000.
10. *Saturday, Oct. 10, 2 p. m.*—Race for Pursuit Type Planes, *John Mitchell Trophy.* Distance 120 mi., 10 times around the closed course of 12 mi. (*First Pursuit Group, pilots only*) Prizes 3 cups.
11. *Saturday, Oct. 10, 3:15 p. m.*—High speed races for Pulitzer *Trophy;* required air speed greater than 175 mi./hr. and landing speed not to exceed 75 mi./hr. Distance 200 km. (124 mi.) four times around a closed course of 50 km. (*civilians and military*) Prizes $4000.

There also will be on all three days very interesting flying events other than the races. There will be a sham battle between National Guard fliers and some twenty tanks of the U. S. Army Tank Corps, balloon sniping, an aerial circus, sham battle between pursuit planes, parachute jumping, refueling in flight, smoke screens, sky writing, radio broadcasting from the air and bombing tests.

The officers of N. Y. 1925 Air Races, Inc., other than Mr. McDonnell are: James B. Taylor, Jr., vice president; Bradford Norman, Jr., vice president; Richard F. Hoyt, treasurer, and Hugh W. Robertson, secretary. The races will be managed by Mr. Robertson, who has had similar experience at previous races at Dayton, St. Louis and Detroit.

The Light Plane Races

The National Aeronautic Association is preparing the following program for light plane events for this year's races which it is hoped can be carried out without detrimental modification. The races are to be held in connection with the Pulitzer Trophy race at Mitchel Field, Long Island, N. Y.

On Oct. 2, 1925, there will be a race for the Dayton Daily News Trophy with $2000 in Liberty bonds as additional prizes. The engine displacement limit is 80 cu. in. as before, and the conditions of the race are to be substantially the same as they were last year, with a climb to 500 ft. in one mile on each five mile circuit of the race.

On the following day, Saturday, Oct. 3, there is to be a Speed and Efficiency Race for Light Planes. Two thousand dollars is already in sight as prizes for this race, and the displacement limit will be as before, 80 cu. in.

The "Nobile" Mechanical Landing System

By LT. COL. UMBERTO NOBILE

Italian Aeronautical Engineering Corps

This system comprises a device on the ground and a device on board the airship. The device on the airship, aside from the usual landing cable hanging from the fore part of the ship, consists of a special automatic anchor attached to the free end of the landing cable, and a small windlass, to the drum of which the other end of the cable is fixed, located inside the nacelle. This device is shown in outline in Fig. 2. By means of a pulley, the anchor may also be run along the landing cable which is fixed at one end to the bow of the airship and at the other end to the drum of the windlass, as already stated above. In the case of a small airship (the Mr for instance, see AVIATION, Vol. XVII, page 913, Aug. 25, 1924), the windlass may be manually operated by one or two of the crew, but normally, in larger airships, it would be operated by means of a small engine.

The device on the ground consists of three braking ropes arranged 120 deg. to each other, converging to one and the same point, Fig. 1. A triangular rope arrangement could also be used, but the star shape is held to be more advantageous. Sandbags, resting on supports, are attached to these ropes. Each free end of the ropes carries a group of sandbags which acting as a counterweight, impart the required tension to the rope itself. The horizontal component of this tension is balanced for the greater part by the friction resistance developed by the group of sandbags resting on the ground.

The dimensions of the ropes, the intervals at which the sandbags are spaced along the ropes, the weight of each sandbag and the aggregate weight of the group of sandbags at the free ends of the ropes (anchoring weights) are determined in relation to the dimensions of the airship. The figures given in Fig. 1 apply to small airships of a volume not exceeding 5000 cu. m. (180,000 cu. ft.).

From the above brief description it will be clear how the landing operations are effected. The airship, still with a slight tendency to climb statically, is approximated to the center of the braking ropes at a suitable height, say, 100 m. (330 ft.). After reducing the velocity to a minimum relative to the ground, the landing cable is rapidly run out from the windlass until the anchor touches the ground. Under these conditions—the airship still continuing to advance slowly—the landing cable comes in contact with one of the three braking ropes and runs along it until the anchor grips it.

In braking, the live force of the airship is absorbed by the deformation work of the rope and by the work in dragging the sandbags over the ground. As a basis for calculation, it must be borne in mind that in the case of ordinary cloth sacks, filled with sand, dragged over a flat and grassy terrain, the friction coefficient is about 0.5. Due to the distribution of the damping weights and the elasticity of the rope, the braking is effected gradually because the number of sacks dragged over the ground increases as the airship advances. The size of damping weights and their spacing, aside from being determined, as stated above, in relation to the dimensions of the airship, must be in relation also with the gradualness required in the braking process.

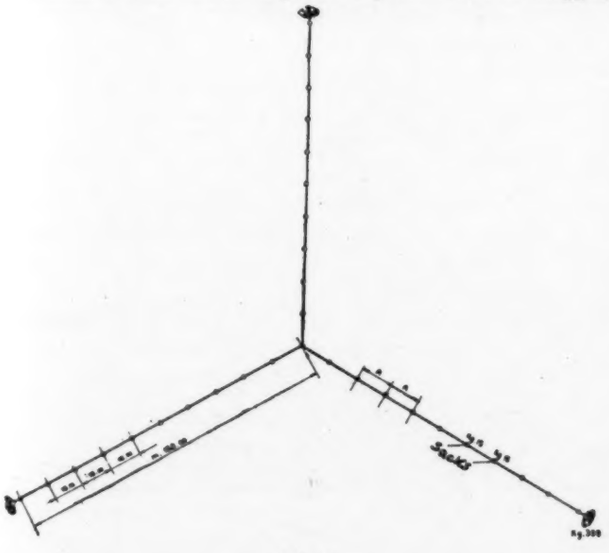


Fig. 1

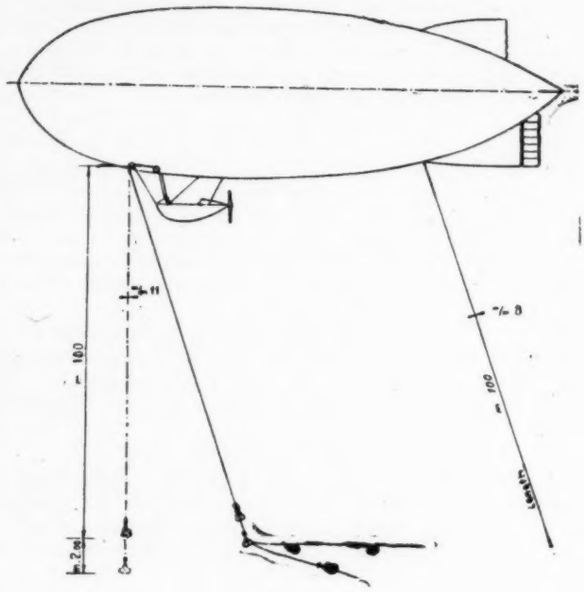


Fig. 2

The initial tension of the rope is of considerable importance. In order to secure smooth braking, the tension must be the minimum compatible with the deflection obtainable in the rope. Immediately the anchor hooks on to the rope the pilot stops the engine, if he has not already done so, and operates the windlass so as to gradually recover the landing cable. In this way the airship is made to descend low enough to permit loading or unloading of persons and things.

The automatic anchor designed by the writer of these notes, and tested out with good results, is worthy of special mention. The first type of anchor is that shown in Fig. 3. It is a very simple device: the braking rope, in striking against one of the levers closing the hooks of the anchor, overcomes the force of the opposing spring, opens it, and gets caught. The numerous experiments carried out demonstrated the necessity of the three hooks being of comparatively large dimensions, and the shank of the anchor comparatively short because otherwise, when the shank strikes against the rope, the anchor may rebound right over the rope without getting caught by the hooks. Furthermore, the anchor must be robust to prevent it deforming on striking the ground.

The second type of anchor is substantially a steel chain each link of which is constituted as shown in Fig. 4. The purpose of the projection on the link is to catch the rope on that particular side which is kept closed by means of a simple spring. As the different links of the chain are orientated necessarily in all directions, the rope is bound to hook on to one of them. This anchoring chain has an advantage over the automatic anchor—confirmed by numerous experiments—

in that it never rebounds on impact, consequently hooking is absolutely insured. Furthermore—provided the weight is not excessive—the chain may be several meters long, therefore less attention need be paid to the landing altitude Finally, experience has demonstrated that the hooking is effected also when the braking ropes are taut at a very small distance from, and almost touching, the ground.

Operating the windlass absorbs a power which is practically proportionate to the volume of the airship, if, for the various volumes, the velocity of recovery of the cable is assumed to be maintained constant. Assuming that a man at the windlass is able to develop a force of 10 kgm. per second (see the data given in this respect in the writer's article: "A Man Driven Dirigible"—AVIATION Vol. XVII, page 934, Sept. 1, 1924) and assuming the efficiency of the windlass to be 0.8, we would obtain a useful power of about 8 kgm., which, under the hypothesis that during the maneuvers the tension of the rope be 25 kg. (55 lb.) for every 1000 cu. m. of volume permits the maneuver itself with a velocity of 8/25, that is, 0.32 per sec. Hence the conclusion that manual maneuver is expedient only in the case of very small airships not exceeding 2000-3000 cu. m. volume (100,000 cu. ft.). In the case of larger volumes an engine must be used, the power of which may be determined practically in the proportion of ½ hp. to every 1000 cu. m. volume.

The Windlass

In the "Mr" airship, the windlass is installed in the nacelle. The windlass consists of a drum turning on supports and fixed to the handrail of the nacelle. In connection with the support, an internal expansion brake operated by a hand lever is installed. The purpose of this brake is to regulate the velocity of the landing cable when, being in tension, it is desired to let it out by the windlass.

The brake consists of a piece fixed to the drum, of an expansion ring fixed to the support, and of a pin incorporated in the control lever. In rotating, the pin expands the ring which, adhering to the internal surface of piece, brakes the drum.

Aside from the brake, the drum is fitted with a double action lock system consisting of two teeth fixed to the support, a toothed wheel fixed to the drum, and of a fitting incorporated in the lever which permits releasing, recovering, or stopping the drum. Lever stops automatically in three working positions by means of a spring system. For operating the drum, there are two handles, one on each side.

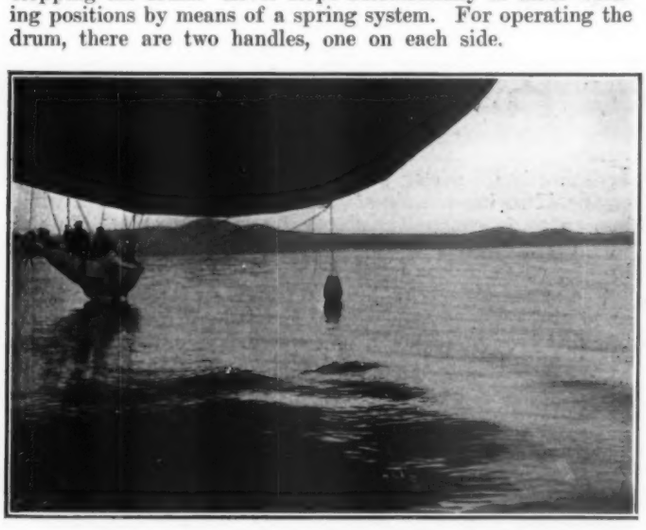


Fig. 5 The airship Mr resting on the surface of Lake Bracciano. The mooring sack is just resting on the water

The system of braking ropes for landing is equally applicable for alighting on the water. In this case no particular care need be taken to keep the ropes taut at a certain altitude above the ground, it being sufficient that they be on the water, and may even be immersed to a certain depth. However, the ropes must be supported by floats (cork, for instance) distributed in the same way as the stands supporting the braking ropes on land. Furthermore, at determined intervals the ropes should carry water sacks of suitable shape and capacity. When the anchor grips the rope, some of the sacks will be entirely immersed and others entirely or partially out of the water. Their purpose is dual (as in fact is also the case of the sandbags in landing) on the one hand, by emerging from the water they balance by their own weight the vertical thrust of the airship, and on the other hand, with the resistence encountered in moving through the water they absorb the live force of the airship. The ends of the ropes are anchored to the bottom of the water by means of adequate counterweights, or by some other appropriate system.

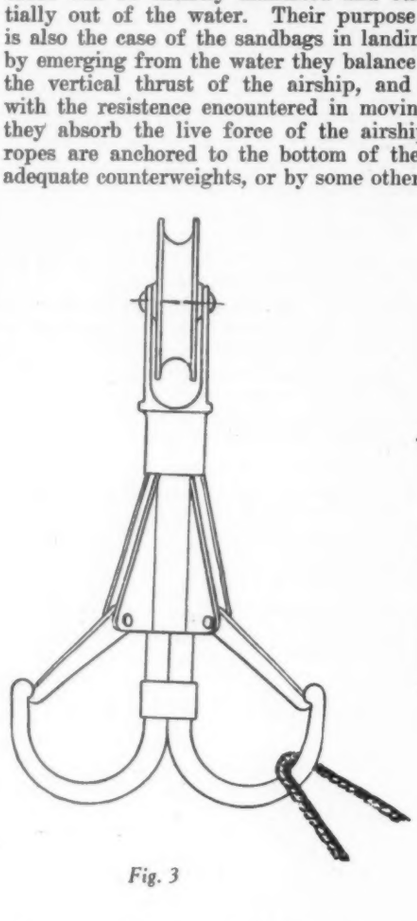


Fig. 3

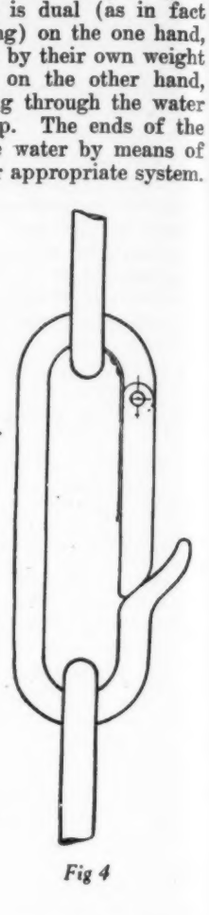


Fig 4

In a number of cases it may be necessary for the airship to remain on the water level still retaining however, within certain limits, the possibility of moving over it, in order to travel by its own means to the point where it must be moored for the purpose of taking in supplies, unloading and loading of persons and things. We will call this maneuver "free alighting" in order to distinguish it from braked alighting.

Free Alighting

The device employed for a free alighting maneuver is shown in Fig. 5. The mooring cable, one end of which is attached to the windlass, carries on the other end a sack of suitable shape and capacity, instead of an anchor. On reaching the surface this sack fills with water and balances the vertical lift of the airship while it absorbs the horizontal thrust through the resistance encountered in moving through the water.

On stopping the engine and operating the windlass, the airship descends until the keel-float of the nacelle touches the water. At this juncture the engine is started and the airship can travel in the required direction, care being taken that the landing cable is fully recovered so as to reduce to a minimum the distance between sack and airship. In fact, in this way the traction exercised by the sack has a comparatively very small transversal component which may be easily overcome by the action of the elevators.

On the other hand, on reaching the surface of the water the sack in the prow may be emptied and substituted by other sacks located at other suitable points of the nacelle. The mooring sack is emptied by pulling on a recovery rope attached to the bottom of the sack itself.

The great number of experiments carried out with the Mr airship on the Lake of Bracciano last March, gave highly

satisfactory results. Persons and things were embarked and disembarked from airship to motorboat and vice-versa without any difficulty whatsoever; evolutions on the surface of the water were made also with the engine at full power, the velocity of 30 km./hr. (almost 20 mi./hr.) being sometimes exceeded.

These experiments lead to the conclusion that the best procedure for maneuvering is the following: at an altitude of 150 or 200 m. (500-600 ft.) the airship being equilibrated statically or with a slight tendency to climb, the mooring cable is run out for a length which is equal to one third of the above altitude. Then, after reducing the velocity, the airship is made to descend dynamically until the sack touches the surface and fills with water. Whereupon the engine is stopped and the maneuver for descent is begun. A good rule is to allow the mooring cable to run out for a certain length after the sack is submerged so that by operating the brake it is easy to graduate the absorption of the live force of the airship through the resistance encountered by the sack itself.

Bombing Facts

Editor, AVIATION:

In the *Saturday Evening Post* of May 23 and 30 there appear two articles entitled "The Limitation of Naval Armament," under which guise we recognized none other than our old friend "Aircraft vs. Battleships."

While not qualified to discuss the momentous question, "Have aircraft rendered the battleship obsolete?" I feel that I may correct several misleading statements in these articles dealing with aerial bombing, as I have dropped some 300,000 lb. of bombs myself.

The discussion of the results of aerial bombardment during the World War is misleading, as the art has been so far developed since that time, that there is little comparison with its 1918 status. As a matter of fact, no satisfactory bombs for use against marine objectives had been developed prior to 1920. In this connection it would appear that the art of aerial bombardment is still capable of considerable further development whereas it is quite possible that the battleship, due to its many years of development, cannot be materially improved upon.

Considerable space is devoted to discussion of armor piercing bombs. Such discussion is misleading as the service types of bombs for use against ships are of an entirely different type, fused to detonate under water alongside the hull. One such type of bomb, developed several years ago and weighing 4,300 lb. was completely ignored in the articles.

The comparison of the effect of gun cotton exploded in air against armor plate, with the mining effect of a bomb exploded under water near the side of battleship is very misleading. Even the uninitiated are aware that water acts as an incompressible medium in such cases, whereas the same is not true of air.

The implication is made that 3 per cent hits may be expected when bombing battleships. **Any bombing team that cannot register 80 per cent hits on such an objective from 9,000 ft. should be returned to school for further training.**

The discussion of the effect of high explosive bombs dropped on New York is misleading in that such bombs would not properly be used against such an objective. Numerous small gas and incendiary bombs would be used instead.

Regarding the use of airplanes to direct gunfire, how much more efficient it would be to have these planes themselves drop bombs on the objective. Especially is this true when we consider that a bombing plane has about ten times the range of the largest gun, the bomb would contain about twenty times the explosive of the largest projectile, and at the longer gun ranges the bomb would be far more accurate.

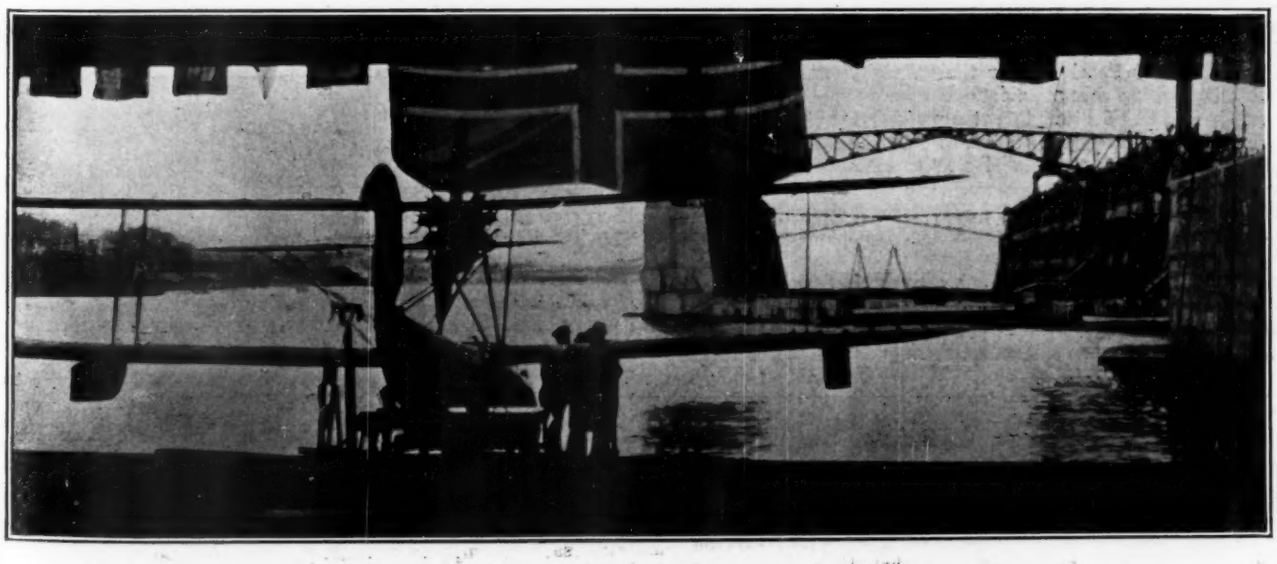
NORBERT CAROLIN

Severe Magneto Test

The life of aircraft engines before major overhauls were required has far exceeded that of the magnetos. Recently, however, two Wright T-3 engines were tested by the Bureau of Aeronautics at the Naval Aircraft Factory. These engines were mounted on torque stands and each engine was equipped with one AG-12-D Scintilla Magneto and a 12-cylinder magneto of another make. The speed was 1800 r.p.m. and both engines finished approximately 190 hr.

Upon examination of the two Scintilla Magnetos, it was found that both were in excellent condition. It was reported that the contact breaker mechanism showed no appreciable wear. In fact, during this test, the contact point gap closed up only 0.001 of an inch.

An Air Cooled Pusher



The launching of the Canadian Vickers "Vedette." This interesting flying boat is equipped with a Wright Whirlwind (J4) 200 hp. aircooled engine. The employment of an aircooled radial as a pusher is quite unusual. This machine was designed for the Canadian Ministry of National Defense for use in their civil work. It has a high speed of 96 mi./hr. and a range of 600 mi.

What Really Happened in Hawaiian Maneuvers

By MAJOR GERALD BRANT
General Staff Corps (Air Service)

The following account of the air activities of the Army and Navy during The Joint Army and Navy Maneuvers in Hawaii was taken from the Air Service News Letter *and therefore represents the best opinion of the air operations against the Blue Fleet. Careful reading indicates that under actual war conditions the fleet attack would have failed.*—ED.

In an illustrated lecture touching on the Joint Army and Navy Exercises in Hawaiian waters, Maj. Gerald C. Brant, Air Service (General Staff), while conceding that the Navy is essential to the security of this country and that we will probably always need some sort of fighting seacraft, stated that it is his firm conviction, as well as that of all the Hawaiian air force, that no force of surface vessels unprotected in the air can ever come in as close to a hostile coast as the Blue Navy did in this case without losing the bulk of its forces, even when opposed by such an inadequate air force as the Air Service had.

Major Brant stated that as a result of various newspaper reports and articles published since the conclusion of these Joint Army and Navy exercises the general impression has gone out that the attack of the Blue Fleet was successful; that troops were landed and that Pearl Harbor had been captured—almost without resistance. Editorials with more or less of an "I told you so air" pointed out that the battleship is still the vital factor in offense or defense; that the maneuvers showed that General Mitchell was wrong and that naval strength is still the big element in our national defense. "As a matter of fact," Major Brant stated, "the maneuvers did not prove any such thing, and those of us who were serving with the air forces during the maneuvers know that it is far from the truth.

"In Hawaii we have an inadequate air force. That was strongly impressed on us when we started to make our plans for the coming maneuvers. It had been agreed by the Joint Army and Navy Board that neither the Army nor the Navy forces constituting the defense of Hawaii would be reinforced for the purpose of the joint exercise; in other words, we were to fight 'as is.'

Dangerous Waters

"The fleet, however, did reinforce the Naval aviation by sending over eight DT's to bolster up the regular Naval aviation unit stationed at Pearl Harbor under Commander Rogers, which up to that time had in their possession only two or three old seaplanes. About a month before the exercise there also arrived at Pearl Harbor the "Wright" and the "Jason" with two more Naval aviation squadrons on board, one equipped with F5's and the other with DT's. We were glad to see them because the problem of scouting long distances out to sea in land planes is really more of a problem in those waters than one would suppose. The waters near the islands are popularly supposed to be full of sharks—large ones with evil dispositions, and always hungry, if local reports are to be credited. In addition, the brisk trade winds which blow most of the year kick up quite a choppy sea. No land plane will stay afloat for more than a few minutes. Even the heavy seaplanes last a comparatively short time at sea.

"Just prior to the Joint Exercise a Navy DT returning from Kanai was forced down in mid-channel and drifted about twelve hours before being picked up. According to reports only one pontoon was then above water and the plane sank a few moments after the fliers were rescued. We did what we could in the way of safety precautions—radio, planes in pairs, inflated in inner tubes, life belts, Very pistols, signal rockets, etc., but we all knew that in case of a forced landing far at sea the chances of being picked up were very small. There is very little navigation on those waters, and although a few Navy tenders were strategically placed during the reconnaissance, they were widely separated. One DH pilot told me afterward that while on one leg of his reconnaissance course, after being out of sight of land for about an hour, he sighted a submarine, and that that lone sub looked to him as big as all of Kelly Field.

"We did fly during the problem about 10,000 mi. over sea, much of it out of sight of land, and lost only one DH. This one landed just outside the reef on the island of Oahu and the pilot and his observer swam ashore on their inflated Martin tubes without being nibbled by the sharks. It was evident then that the Naval aviation units should logically do the long distance reconnaissance. I might state that this reconnaissance was well carried out. According to the rules of the problem no scouting could commence prior to 5.00 a. m. on the 25th—the opening day of the exercise. At 5.20 a. m. (twenty minutes after the opening) the planes from our advanced base on the Island of Lanai discovered the Scouting Fleet anchoring in the Lahaina roadstead, with tenders off the south coast of the island of Molokai. This was correctly estimated as an attempt on the part of the Blues to establish an air base on land. This was confirmed later by the Chief Umpire who sent several synthetic messages, ostensibly from our Lanai base, reporting the arrival of various detachments of land planes (constructive) flying to the base on Molokai from seawards, presumably from an airplane carrier. We promptly proposed to launch a constructive air attack against this constructive base, but no constructive attacks were allowed by the umpires. Late in the afternoon the Navy landed a seaplane on the beach, substituted wheels for pontoons and flew it to the Molokai field (Cookes Ranch). This plane was said by the umpires to represent 36 enemy planes; so at dawn the next morning one of our DH's, representing 46 Black planes, flew over to Molokai and attacked the enemy's represented 36 planes. This attack, however, was not allowed by the umpires, who desired a real attack. This was decided against by the Commanding General, Hawaiian Department, and by the Commandant, 14th Naval District, who made a strong protest against requiring our squadrons to go out over 70 mi. of sea to look for imaginary enemies. As a matter of fact, we had figured on playing the game squarely and as we had planes opposed to nearly the same number with the Navy we expected that air tactics would have an important part to play. It is obvious that tactics have no place in combat against imaginary planes.

"We had established our advance scouting base on the island of Lanai which has an excellent natural airdrome, large enough to accommodate the entire air force. A certain degree of secrecy had attended the organization of this base and the planes were not flown there until the day before the problem commenced. The radio station which we had installed there, however, in a burst of enthusiasm, sent in a message announcing the safe arrival of the detachment. This message was sent in the clear and was picked up by the Blue Navy which at that time were only a short distance away. This resulted, of course, in landing parties being promptly sent on the 25th to capture our Lanai base. The first attempt ended in complete disaster, as the Commanding Officer of the Lanai detachment formed a provisional attack squadron with seven DH planes and theoretically sunk the "Shawmut" and destroyed the landing party. Later in the afternoon a larger force of seven destroyers was seen converging on Lanai; so the Commanding Officer very properly withdrew the detachment to Oahu, after bombing the constructive air base on Molokai.

"During that day and the succeeding one, reports from our planes were received almost hourly giving various items of information concerning the Blue activities. Detached destroyers and cruisers ventured in near shore and were much surprised not to be immediately pounced on by the Air Service, but with the exception of a few isolated attacks by planes on reconnaissance duty no operations were undertaken.

Scouting missions went out as per schedule and all attention centered on discovering the whereabouts of the "Langley" and the Main Fleet. On Sunday morning (obout 11 a. m.) our reconnaissance planes definitely reported the presence of the Scouting Fleet, comprising one battleship, six cruisers, and several destroyers escorting two transports, and located in a general direction southwest of Oahu and about 50 mi. off the coast. At about 2.30 p. m. a combined attack was made on this force, participated in by Black planes, Army and Navy, and the Blue Scouting Fleet theoretically destroyed. This attack was made through a storm of wind and rain, so severe at times on the way to and from the objective that the nearest plane in formation could scarcely be seen. The attack emerged from the clouds at 1,000 ft. directly over their prey.

Fleet Sunk

"A series of photos taken from No. 2 plane in the leading flight of the 23rd Bombardment Squadron are conclusive proof of the de truction of this Naval force. It was raining at the time, deck awnings were covering many of the anti-aircraft guns; the ship's planes are shown on deck or in the catapults; and the anti-aircraft guns which are visible are still horizontal—indications that the attack was a surprise, as was to be expected in such weather. The entire formation returned to Oahu after the attack, having lost but two planes, one DH in the sea and one DH forced down near Barbers Point. Late that evening two Black Navy seaplanes on reconnaissance discovered the "Langley" about 60 mi. south of Oahu, and flying over her at a low altitude theoretically bombed her with eight 220 lb. bombs. It is obvious that even small bombs would have a disastrous effect upon the deck of the "Langley," but the umpires did not make any decision, nor did they in the case of the attack against the Scouting Fleet earlier in the afternoon.

"When the seaplanes reported the presence of the "Langley" the Commander of the Black Naval Aircraft Squadrons decided on an immediate attack. One Army Pursuit Squadron protected the take-off of the two Navy Squadrons, but no other Army units participated in the attack on account of the low visibility and approaching darkness. The Naval units went to the reported location of the "Langley" but she had fled. After scouting around, the flight returned to Pearl Harbor, arriving long after dark. No particular credit was given the Naval aviation for this attack, as the objective was not reached, but to my mind it was a very daring piece of work, showing the high degree to which aerial navigation in the Navy has progressed. Their return to a small island in the darknes and rain, with practically no visibility, after cruising around on various courses for several hours, was a fine thing. We should have more practice in this sort of navigation in the Army.

Attack

"At a council of war held that evening, it was decided that the presence of the Scouting Fleet probably foreshadowed an early morning attack on Oahu. All combat units were therefore ordered to be in readiness for a dawn attack, pursuit to be in the air half an hour before dawn. Commencing at 2.00 a. m., the sea areas south and west of Oahu were lighted with flares dropped every half hour. At 2.30 a. m. the main body of the fleet was discovered approaching Oahu from the west and was kept under observation from then till dawn, when an air attack with all Black Army and Navy units was launched. The reconditioned airway flares worked very well and, by the way, were of great aid also to the Blue Navy who were conducting all night operations without lights. As a matter of fact, one Navy officer fervently thanked me afterward for the great assistance our flares had been to them in preventing collisions.

"At dawn a combined attack was made on the Fleet. Photographs were taken showing the appearance of the sea areas off the Haleiwa coast at dawn, also of the transports, tenders, cruisers and battleships as they were bombed, and landing parties in boats and on shore as they were being machine gunned by the attacking planes. The order of target priority in attack was first the transports, as they were considered most dangerous and most vulnerable. It is our belief that none of these transports would have escaped. An attack could have been made during the early hours of the morning, but with so many air units, both Blue and Black, operating in a comparatively small area at night the chances of accidental collision were very great, so it was not considered. The Blue Navy were actuated by the same considerations of safety and no landing of troops was attempted till dawn. It should be borne in mind, however, that in time of war these operations will be carried out at night, and chances taken that we were not justified in taking in a peace time maneuver. As a matter of fact, the landing parties had no picnic in getting ashore through the surf and coral in the daylight.

"After dropping their load of bombs on the vessels all units except the Heavy Bombardment acted as attack aviation and machine gunned decks and small boats on their way in. Three attacks were made in all—the planes returning to the airdrome after each attack to be re-armed and refueled.

"In the critique which followed the exercise the Air Service made no claim for damages. We did not assert that bombs had sunk or damaged a single vessel, but it is significant that five Blue Admirals expressed ideas indicating that the question of air operations in such a maneuver is of paramount importance, and that the success of the undertaking would very probably depend upon securing air supremacy.

"We had expected a very determined Blue air resistance to our attack, but it did not materialize. Lack of fighting cohesion will always be the rule where fighting planes are so widely scattered in the Navy as they are at present, with only one or two on each battleship or cruiser. We had expected also bombing attacks from the "Langley" against Pearl Harbor and against our coast defenses. The Sixth Pursuit Squadron which was left on the alert at Luke Field accounted for practically every enemey plane that came over, actually forcing down and capturing five or six Blue pilots who ventured in that vicinity.

Conclusions

"There were several serious lessons drawn from the maneuvers, most of which have been explained in confidential reports to the War Department and to the Chief of Air Service. Some deductions can be drawn which are not secret:—

a. That bad weather offers no unsurmountable obstacle to successful air operations; in fact, bad flying weather may well facilitate the attack.

b. Darkness no longer offers an impenetrable cloak of secrecy. Our present flares light up the sea and landscape with surprising detail.

c. It is believed that larger carriers or a greater number of them are necessary with the Fleet if it is ever to have any superiority in the air.

d. That even with a number of carriers a land base is absolutely necessary for any extended operations. It is, of course, possible to secure air supremacy in any particular area for a limited time by the simple expedient of concentrating air units there. This superiority is of limited duration, however, unless the hostile air force is practically destroyed. The answer is an increased force of fighting planes and pilots for both the Army and Navy.

e. It must be obvious nowadays to all except the most desk-hardened bureaucrat that our own United States has not that grand isolation which it has enjoyed in the past. The airplane and its carrier can bring an aerial menace very quickly to any place on the globe not adequately protected by its own air forces.

f. It is the concensus of opinion in all the air units that took part in Joint Exercise No. 3 that the first and primary line of defense of our coast lies in the air. It is inconceivable that such an attack as was launched against Oahu could hope for even a measure of success unless and until air supremacy is assured.

"Commander Yarnell, commanding the Aircraft Squadrons of the Scouting Fleet, said that the most valuable part of the exercise was the association of Navy fliers with Army fliers, as they learned a great deal about aerial tactics, formation flying and combat work. They had had practically no combat work as we know it.

"We expected the Navy would try new ideas. We knew they had smoke laying apparatus and had been experimenting with tear gas. We equipped a Martin Bomber and two DH's with smoke apparatus. The Kohala District of Honolulu is the exclusive residential district; most all the servants are Japanese. When the smoke screen laid down by the Navy at Diamond Head struck the beach many servants packed up and beat it, thinking it was a gas attack. So far as is known, there is no way to avoid a gas attack from fast planes delivered at night. We should think about this in the Air Service as to the use of gas from airplanes in the next war. The smoke screen went back over the country three or four miles, still retaining its dense form. As far as beach defenses were concerned, it would completely destroy their local observation and the enemy could advance in small boats."

"Touching on the use of radio during the exercise, Major Brant stated that they had the SCR 134 sets for use in the DH's and SCR 135 sets for the Martin Bombers. These were received such a short time before the maneuvers that the advisability of their use was doubtful. The sets were used, however, to good advantage and it is the opinion that the SCR 135 sets are the best developed for airplane use so far. During the maneuver it was found necessary to use the telegraph set, as it had a sharp penetrating note and could get through any kind of interference. The telephone did not work so well with all the other sets going and the air was full of radio all the time.

Commander Loftin of the Navy worked up a simple code covering all possible contigencies that reconnaissance would be called on to use. There was one code for artillery, another for infantry, and one for anti-aircraft. A radio operator in one of the planes had to be a "wiz." In Hawaii a great deal more practice in radio is needed."

With regard to the use of anti-aircraft during the Exercise, Major Brant stated that an order was issued directing the Commanding General to conduct, on the afternoon of the close of the maneuver, a conclusive test to demonstrate the efficiency of anti-aircraft against aircraft. This consisted of firing at two ranges at altitudes of 4,000 and 8,000 ft., at a towed target over a given area, towed by a Martin Bomber. No such test is conclusive, no more conclusive than the known-distance target practice of an infantryman. General Patrick wrote protesting this conclusive test. The Air Service, however, had to prepare three Martin Bombers with winches and targets, and expected to carry out the test until the War Department finally cancelled the order.

Major Brant stated that the Air Service made no claims at all, but that the first five admirals who spoke at the Critique, without any urging, made reference to the necessity for air power, three stating that this operation could not have been attempted even without first securing superiority in the air. He believes that the Navy is trying to get on the band wagon; that they see what is coming in aviation; further, that the Navy will embark on a compaign to greatly increase Naval aviation, and to take our coast defense and put it with their Naval aviation.

In conclusion, Major Brant stated: "I would like to say a word of praise for the enlisted men of the Hawaiian Air Force. Our pilots were good—even the Navy admitted that—but we all know that the enlisted mechanic is the bird who keeps the planes in the air, and the fact that everything went off so well is a high tribute to the enlisted force. I have never seen planes in better shape."

Litchfield Finishes Quarter Century With Goodyear

P. W. Litchfield, vice president and factory manager of The Goodyear Tire & Rubber Co., and vice president and general manager of the Goodyear-Zeppelin Corp., on July 15 completed 25 years of service with the Goodyear organization.

For the past 15 years Mr. Litchfield has been a close student of aeronautical development and it was through his efforts that his company became interested.

The first Goodyear aeronautical product was constructed under his direction and since that time he has seen more than 800 balloons and 90 airships built for commercial and army and navy use by Goodyear.

In 1918-19 Mr. Litchfield was a member of the naval commission on European airships, studies being conducted in England, France and Germany, and he was a principal figure in the negotiations which brought the Zeppelin patent and operating rights to the United States.

He is the donor of the Litchfield trophy for the National Balloon Races.

Paul W. Litchfield

Mr. Litchfield came to Goodyear when the company was less than a year and a half old, and directed the construction of Goodyear's first automobile tire. During the first week of July this year the 75,000,000th tire built by Goodyear was turned out—the largest production made by one company, and by far the largest production under the direction of any single man.

Mr. Litchfield was born in Boston on July 26, 1875, and will celebrate his 50th birthday during the month. He graduated from Massachusetts Institute of Technology in 1896 and joined Goodyear four years later.

Determination of Turning Characteristics of an Airship by Means of a Camera Obscura

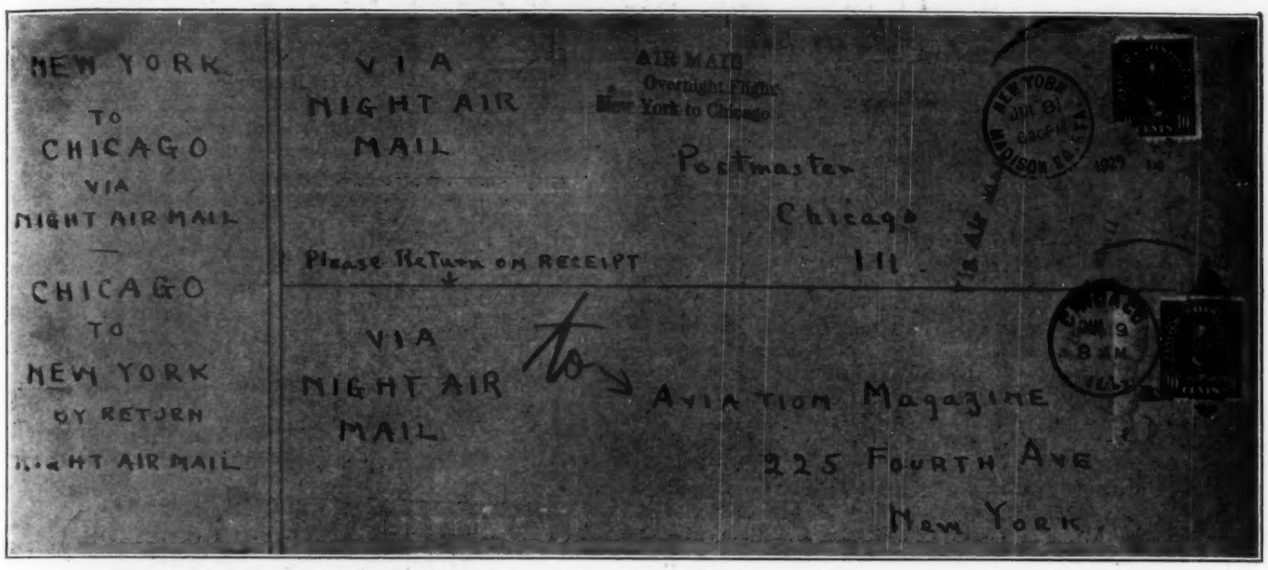
N.A.C.A. Report No. 208

This investigation was carried out for the National Advisory Committee for Aeronautics at Langley Field by J. W. Crowley, Jr., and R. G. Freeman, for the purpose of determining the adaptability of the camera obscura to the securing of turning characteristics of airships, and also of obtaining some of these characteristics of the C-7 airship. The method consisted in flying the airship in circling flight over a camera obscura and photographing it at known time intervals. The results show that the method used is highly satisfactory and that for the particular maneuver employed the turning diameter is 1,240 ft., corresponding to a turning coefficient of 6.4, and that the position of zero angle of yaw is at the nose of the airship.

Report No. 208 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

A Convincing Demonstration

The First Round Trip Night Air Mail Letter
New York — Chicago — New York



The First Round Trip Night Air Mail Letter

To show the practical utility of the new Night Air Mail Service between New York and Chicago by a novel test, a letter was mailed in New York at the Flatiron Building on July 8, at 5:30 p. m. It bore two addresses as will be seen from the illustration below. Over the lower Air Mail stamp a sticker was loosely pasted which was to inform the Postmaster in Chicago that under it was the "postage for return trip." No request was made either in New York or Chicago that any special attention be given to the test letter. It was just dropped in one of the many red, white and blue Air Mail boxes in New York City. The upper postmark on the letter shows that it took only one hour for the letter to be collected and taken to the Post Office where the stamp was cancelled at 6:30 p. m.

From here to Chicago the usual routine of the Night Air Mail was probably followed. The letter was sent by train to New Brunswick, N. J., carried by truck six miles to Hadley Field where the night plane was waiting to take-off at 10:30 daylight saving time or 9:30 Eastern Standard Time. The flood lights make the entire field brilliant with a subdued light that lets the pilot take-off with the same certainty as during the day. Then the letter passed over the flashing beacons that are located every five miles on the tops of the mountains and at places where visibility is best. At Cleveland the letter is transferred to another plane and again takes the air for its final flight to Chicago where it arrives, about 6 a. m., at Maywood. Here, again, it is hurried to the Chicago Post Office where it receives a postmark on the back "Chicago, July 9, 8 a. m."

The efficient Chicago postal people evidently wasted no time in remailing the letter as the lower return stamp was cancelled at 8 a. m., too. The impatient letter then had a twelve hour wait before it started on its return journey. Retracing its westward flying route, it arrived at the New York Post Office as shown by the postmark on the back at 10 a. m., July 10, and was delivered at the office of AVIATION at 11 a. m.

This letter shows better than any words can express the practicability and reliability of the new Night Air Mail Service that has now been in active operation for over two weeks. It is the first letter to make a round trip by Night Air Mail on succeeding nights. It represents a saving of over two whole days over the ordinary mail. The twelve hours that it waited in Chicago would have been ample time to have allowed its contents to reach its recipient and a reply sent.

On receipt of the letter the following telegram was sent to Hon. Harry New, Postmaster General:

"Just received first round trip letter New York-Chicago-New York by Night Air Mail—letter mailed here day before yesterday at 5 p. m.—arrived Chicago yesterday morning and remailed—arrived our office eleven this morning—congratulations on fastest mail service in world—letter was in air sixteen hours on the two nights and demonstrates the great utility of the new service."

LESTER D. GARDNER, Editor, AVIATION.

United States Civil Service Examination

The United States Civil Service Commission announces an open competitive examination for the position of junior aeronautical engineer. Receipt of applications for junior aeronautical engineer will close Aug. 8. The date for assembling competitors will be stated on the admission cards sent applicants after the close of receipt of applications.

The examination is to fill vacancies in various branches of the Government service throughout the United States. The entrance salary in the District of Columbia is $1,860 a year. Advancement in pay may be made without change in assignment up to $2,400 a year. For appointment outside of Washington, D. C., the rate will be approximately the same. Promotion to higher grades may be made in accordance with the civil service rules.

The duties of this position are routine testing, performing field work, making computations, assisting in conduct of experimental research tests, compiling reports, handling technical correspondence, and other related work.

Competitors will be rated on general physics; pure mathematics; practical questions on the subject of aeronautical engineering including applied mechanics; and education, training and experience.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or custom house in any city.

The Pander Light Plane

Dutch Light Plane That Has Been Making Remarkable Cross-Country Flights in Europe Described

H. Pander and Sons of the Hague, Holland are now in production of their light plane, type D. This machine has been very well received in Europe. It has made several very fine cross-country flights, notably, from Rotterdam to Barcelona. It has been the policy of the manufacturer to have one of their machines spend a week or ten days at the important airports and invite everyone to fly it. This has resulted in the machines excellent flying qualities being very well known among potential users.

Wings

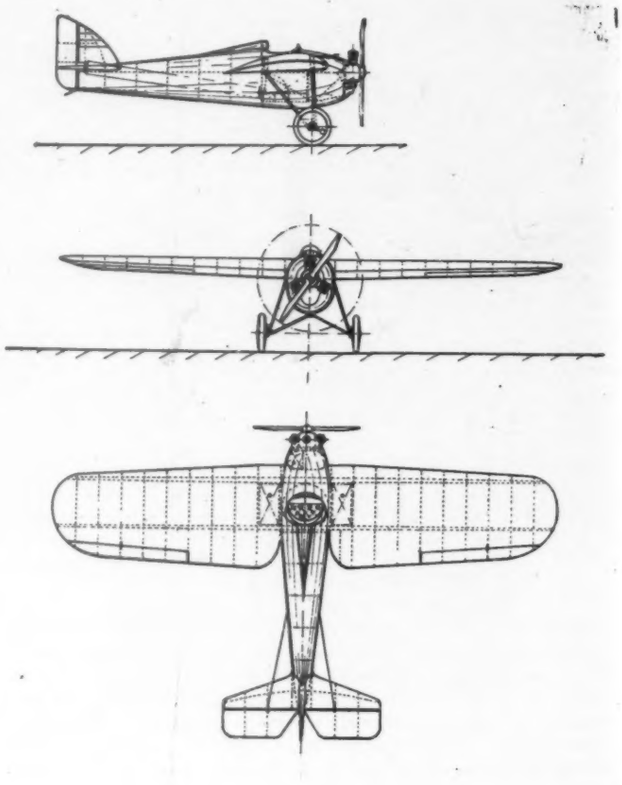
This machine is a high wing cantilever monoplane. Great pains have been taken with the streamlining and the good performance achieved with such low power is very largely due to this. The wing is in one piece and rests on the top longerons, each spar being secured by long U-bolts carrying yokes above the spar. The spars are of box section, with spruce flanges and three-ply walls. The front spar is of somewhat unusual arrangement and forms a box with the plywood covering of the leading edge. The curved wing tip is fairly thick, and is built up of a great number of laminations afterward spindled out to an approximately semi-circular section.

Fuselage

The fuselage is a monocoque, consisting of light longerons and hoops with a three-ply covering. Actually the fuselage is flat sided, but the turtle back and bottom fairings merge into it so gradually that the impression is given that it is elliptical. The pilots cockpit is placed between the wing spars, the curved coaming being placed around the cockpit after the wing is in place. Stick control is provided and in place of the rudder bar there are two tubular pedals with heel rests and toe guards.

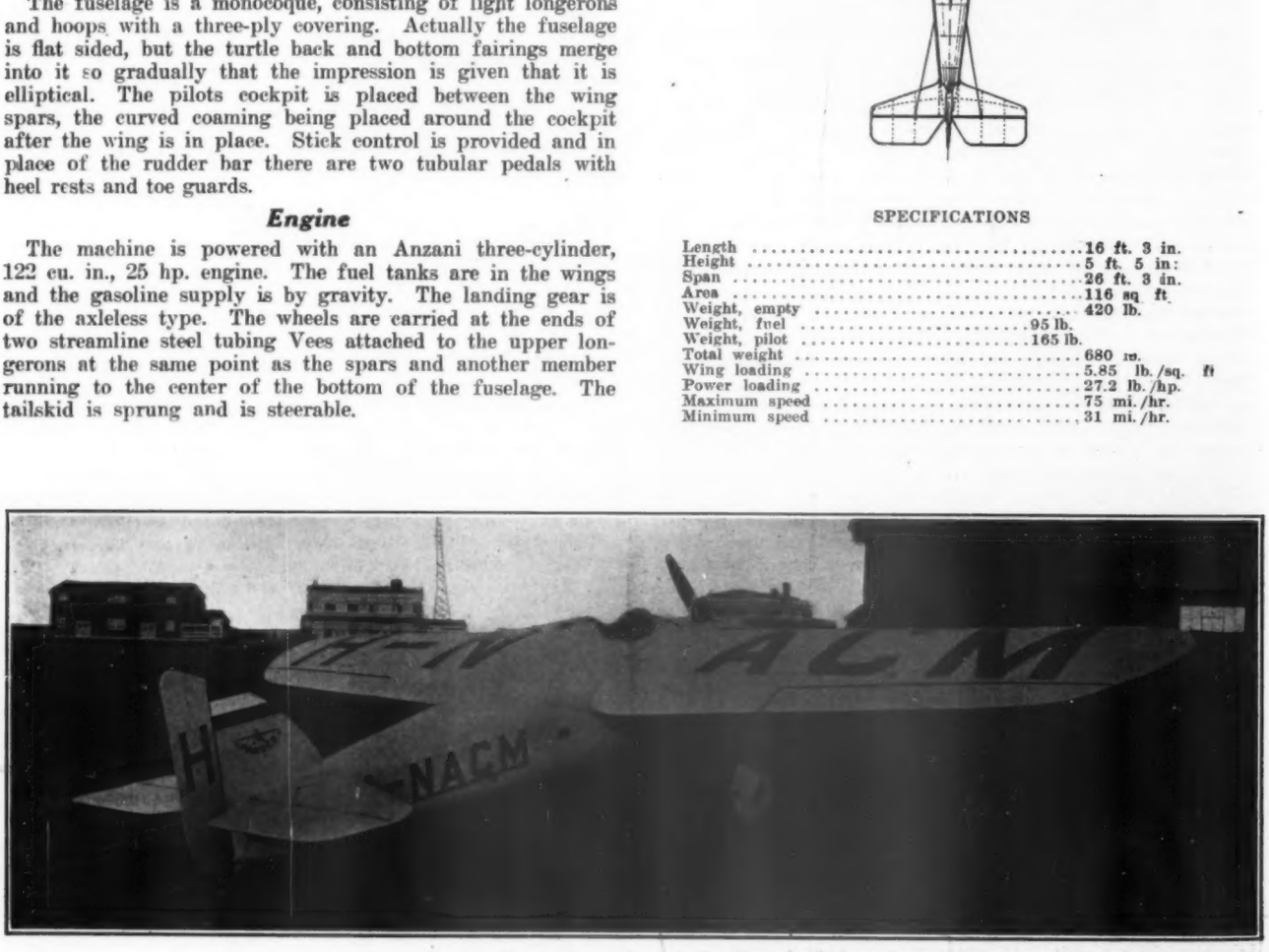
Engine

The machine is powered with an Anzani three-cylinder, 122 cu. in., 25 hp. engine. The fuel tanks are in the wings and the gasoline supply is by gravity. The landing gear is of the axleless type. The wheels are carried at the ends of two streamline steel tubing Vees attached to the upper longerons at the same point as the spars and another member running to the center of the bottom of the fuselage. The tailskid is sprung and is steerable.



SPECIFICATIONS

Length	16 ft. 3 in.
Height	5 ft. 5 in.
Span	26 ft. 3 in.
Area	116 sq. ft.
Weight, empty	420 lb.
Weight, fuel	95 lb.
Weight, pilot	165 lb.
Total weight	680 lb.
Wing loading	5.85 lb./sq. ft.
Power loading	27.2 lb./hp.
Maximum speed	75 mi./hr.
Minimum speed	31 mi./hr.



One half rear view of the Pander, Type D, light plane

AIRPORTS AND AIRWAYS

Kansas City, Mo.

By Allen Quinn

The Chamber of Commerce and the Kansas City Municipal Projects Committee are busy seeking a site for a municipal airport. An appropriation of $300,000 for the establishment of a city owned field has been recommended by the Projects Committee. One site, just across the Missouri River in North Kansas City has been offered for use to the city as an air field for one year, rent free, by the North Kansas City Improvement Association, with the right of purchase.

There are a number of objections to that site, however. The price—$3,000 an acre—is considered too high, and then there are hazards to be considered. There is a manufacturing plant on the north side of the 300 acre plot and on the south, the prevailing take-off here is the Missouri River and the city. Several other sites are in prospect but the matter is still in the air. An extensive study of what other cities are doing for aviation has been made by the aviation committee of the Chamber of Commerce.

Regular daily trips between Kansas City and Wichita, Kan., were begun by the Kansas City Airways Transportation Co., Tuesday, July 7. The schedule calls for a plane to leave Kansas City at 8 a. m. each day, arriving in Wichita between 10:30 a. m. and 11 a. m. and to leave Wichita at 4 p. m. One way fare is $30 and $55 for a round trip. The distance is 225 mi. The company is using Lincoln Standard 5 place jobs and plans to use cabin ships in the near future.

Fokker, the famous European aeronautical engineer, recently spent several days in Kansas City in conference with business men regarding the possible establishment of a Fokker factory here. No definite plans have been announced but the location of a Fokker plant here in the near future is said to be assured. A number of local business men accompanied Fokker to New York to go into further details of the plan.

Fokker announced himself favorably impressed with the prospects here, declaring Kansas City was ideally situated for an aircraft factory because of its central location and because of the level type of country.

Another aircraft company—the Globe Aircraft Co.—has been established and is purchasing planes for passenger transportation work, although no definite routes have been announced as yet.

An unusual interest is being displayed by the general public following much publicity in the local newspapers for the air mail and the new air transportation companies.

Cleveland, Ohio

By Cy Caldwell

"Amid dash of aerial splendor Cleveland Municipal Airport, the nation's—yes, the world's newest and best aviation field, was officially opened July 1st. Planes, like great weird birds, big ones and chicks, sang a strange wild song as they hurtled skywards."

Thus did one Cleveland reporter break out in a rash, and smear himself all over with language. He had probably been listening to the speeches at our Aviation Dinner and got his intellect all upset.

The opening ceremonies began with a dinner in the Public Auditorium given by Cleveland Chapter N.A.A., and attended by 2,000 people—probably the largest aviation dinner ever given. If not the largest, certainly the most indigestible. There were speeches by many prominent men, but as I was not there they did me no harm so I won't be mean enough to publish their names. At heart they were perhaps good fellows.

Over 200,000 people gathered at the Field to witness the ceremonies and the arrival of commercial planes, and the first flight inaugurating night Air Mail service between Chicago and New York. When Pilot Shirley J. Short landed from Chicago he received a great ovation, as did Paul Collins when he took off for New York. The crowd went wild. One woman sat right down and wrote a poem—"Hail ! Brave Messenger of the Air !" She was probably the wildest one there.

There was a deafening roar of applesauce when I landed in a Martin commercial plane with a load of imported dresses and furs from New York, consigned to a Cleveland store. I also carried a Press reporter who in his published account of the flight referred to me as "a gangling, amiable Scot." I'm not Scotch and I'm not amiable. And I'm going to look up that word gangling. It sounds to me like a dirty crack.

Anyhow the Glenn L. Martin Company's was the first express plane to land at the Airport, beating Ford's "Maiden Dearborn" by 25 min. That tickled me. Henry has given me many a bump in his car, so I took great pleasure in bumping him out of being the first air express to land here. His plane brought over a Ford roadster in pieces which were assembled on the Field. It looked just like the rest of them—and sounded the same too.

Art Smith in a Martin Commercial plane did loops at night, leaving a trail of light from fireworks attached to the plane. A fine exhibition of night stunting was given by Army pursuit ships piloted by Major Landphier, Lieutenant Matthews and Lieutenant Schulgen. Other Army Air Service pilots did splendid work to entertain the vast crowd, and received the thanks of the City for their very fine efforts.

The home-going crowds got stuck in the worst traffic jam ever recorded in Cleveland. It was cleared after 2 hr. strenuous work by the Traffic Dept. assisted by Casey Jones, a metal prop salesman from Garden City, who flew here from New York with William Arthur of the Spalding Construction Co. of New York, who erected the new Air Mail hangars on the transcontinental airway.

The Field lighting does credit to the Air Mail and Wm. E. Thomas who was in charge of the work. Standing at the far end of the Field I could read with ease if not with enjoyment, a couple of bills from my tailor. The splendid condition of the runways is due to the work of Jack Berry, two steam shovels and a dozen trucks and tractors, which worked day and night for over a month to make a level field. The steam shovels are worn out, but Jack is fresher, redder and fatter than ever.

The Ford Motor Co. is now running a daily express service between Detroit and Cleveland with Stout All-Metal planes bringing spare parts here. At present the planes arrive loaded and depart empty, to the alternate joy and chagrin of the efficiency experts of the Ford company. They are working out a plan to get a load for the return trip and will soon be flying old Ford cars back to Detroit to be melted up and cast in small weights to be hung onto the bottoms of balloon pants to keep them from flapping in the wind.

Garden City, N. Y.

Fox News has purchased from G. S. Ireland, sales representative for the Curtiss Aeroplane & Motor Co., a brand new C6 Oriole. The machine will be used for fast cross-country transportation of their newsreels. George Weiss, a well known and competent pilot has been retained as pilot, and will make Curtiss Flying Field at Garden City, N. Y., his eastern operating base. This is another mark in the progress of speedy and dependable transportation by air. There is no question but what Fox News will make many news beats over those newsreels that do not avail themselves of this class of service.

Last Friday, Albert Pick, president of the Albert Pick Co. of Chicago, happened to be in New York on business and late that evening learned that his presence was required at the Chicago Stock Exchange in connection with the $30,000,000 failure of the Dean, Onatavia Co., early the following

day. Mr. Pick phoned the Curtiss Exhibition Co. at the Garden City field and at 4:30 a. m. the following morning a Curtiss Oriole, piloted by Andrews, carrying Mr. Pick took off in the darkness and headed for Chicago over the Air Mail route. At exactly three o'clock that afternoon Mr. Pick stepped from the ship, and was in his office fifteen minutes later, just ten hours sooner than he could have been there by any other means of transportation.

International Newsreel Photo

American Gordon Bennett Team and officials. Left to Right: Burgemeister Max, Brussels; American Ambassador Phillips; W. T. Van Orman, pilot; and C. K. Wollam, aide

Parachute Demonstration

When the exhibition parachute, the rope of which was attached to her waist, failed to open when she leaped from the cockpit of the plane piloted by Lieut. Hugh Watson, Mrs. Irene McFarland, 18 years old, Chicago aviatrix, narrowly escaped death when she pulled the rip cord of the Government seat type pack parachute supplied at the direction of Maj. E. L. Hoffman, commanding the airport at Grisard Field, Cincinnati and floated safely to earth in view of 10,000 spectators who witnessed an air meet at Grisard Field June 28.

Mrs. McFarland's jump came as the climax of the afternoon's performance of "stunt" and exhibition flying staged by Lieutenant Watson with the aid of Lieuts. Paul Riddle, Wright Vermylia and Dudley Outcault, Army Reserve fliers. The parachute which Mrs. McFarland, whose husband is J. D. McFarland, carried was a spread of canvas packed in a bag fastened to the undercarriage of a plane piloted by Lieutenant Watson. To her waist was attached a rope and leather strap. When she jumped from the plane the weight of her body was supposed to open the parachute. It did not pull it out of the bag.

Under the rules of the Government flying fields persons flying in planes from such airports must wear the Government parachute, which Major Hoffman has been instrumental in developing. Under the direction of Major Hoffman this was supplied.

It was this parachute that saved Mrs. McFarland's life. When she leaped the weight of her body failed to open her own parachute and she hung suspended 3,500 ft. in the air while Lieutenant Watson signaled to her to pull the rip cord of the Government parachute. This opened perfectly, but not without extreme danger to both Lieutenant Watson and his performer.

Denver, Col.

By R. S. Bee

Denver now has a National Guard Sqd. and a field—Lowery Field, and they do considerable flying. They have just received a TW3 high lift wing job which is much better in this altitude than the JN's. Major Dayton and Dan Kerno just came back from Los Angeles, which they made in a DH in one day out and one back. Mr. Maydeck is rebuilding two Lark monoplanes to use for advertising. They will be high lift jobs.

Mr. Don Hogan has bought the old Humphries Field and it is known as the Don Hogan Airport, and a better field is hard to find. It is fine to see a field which has lain idle for several years taken over. Earl Parker is manager of the field. They have started a company called the Colorado Airways, and at present have two new Standards and are carrying passengers anywhere in the state at a reasonable rate. The Denver estate park trip is $100.00 for two passengers round trip and is about two hundred miles up and back. Many people are making the trip daily. Mr. Hogan and Denver are lucky as a man named Joe Hammer arrived recently from Markham, Mo., who claims to have been flying fourteen years and a former employee of Nicholas-Beasley Airplane Co. Joe has been in Denver about ten days and has rebuilt a Standard which will be ready for testing next week. He is also building a special job for cross country work, a shortened standard fuselage with four lower standard wings and C6 motor.

N. A. Wimer, a Denver stock broker bought the old Ansaldo for advertising purposes and had Casey Tarraye flying it. They made a test flight with the mail from Denver to Pueblo to Cheyenne in one hour fifty minutes.

The Alexander Aircraft Co., a branch of the Alexander Industries, opened its new airport July 4. J. Don Alexander, president of the Alexander Film Co., has made an intensive study of commercial aviation. He brings to this new industry years of organization experience, a record of phenomenal success in the motion picture publicity business, a national sales force of one hundred high class salesmen, unquenchable enthusiasm and a strong belief in the future of aviation.

Daniel Noonan, an Air Service reserve officer and former factory superintendent for the Longren factory, Topeka, Kans., is the chief engineer. The company is building a new model light commercial plane, specifications of which will appear in a later issue. J. A. McInaney, formerly assistant sales manager of the Film Co., is sales manager and chief pilot.

The field is located two miles south and one mile east of Englewood, Col., which is seven miles south of Denver but which is in reality a part of Denver. While the field was still being put in shape, it already had two visiting planes—Rust and Martin from Texas and Tommie Thompson from Salt Lake City both flying Hisso Standards.

The Alexander Aircraft Co. has four Longrens and one Swallow which will be replaced as their own are completed.

Portland, Me.

By Dr. Albert Johnson

Activities of the Stroudwater Flying Field in the city of Portland have opened with a big boom this year. We have now eight ships on the field all the time and expect at least a dozen more to be purchased just as soon as the present class of students are finished off. This is a decided increase over last year this time when we could boast of but one solitary Jenny. We have installed a 500 gal. gas tank and have just completed the construction of one of the 1,500 ft. runways. Several DH ships have visited the field from Boston in the last few weeks and we are to have one quartered here for a while this summer. The flying school operated by William H. Alexander, otherwise known over the entire country as "Bill" is growing steadily and the signing up of students occurs almost daily. The Shenandoah passed over the field July 3 and ships were sent up from our field to act as an escort while she cruised around Portland. We feel that we have accomplished a great deal in stimulating aviation in the short space of time of one year in Portland without any aid from the city whatsoever.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Defense Day

More than 200 newspapermen flew at Mitchel Field in a great fleet of Army airplanes on Saturday, July 4, as part of the National Defense Day program in which the nation's air forces played a leading part. The representatives of the press were guests of the U. S. Army through the invitation of Maj. William N. Hensley, commanding officer of Mitchel Field and the 9th Observation Group, Army Air Service. Forty airplanes were at Mitchel Field to carry the visiting newspapermen and they made two flights over New York City, one shortly after eleven o'clock in the morning and the other at three in the afternoon.

For the morning flight, three crack formations took the air, led by Maj. William N. Hensley and commanded respectively by Capt. E. Keesling and Lieuts. S. M. Connell and M. L. Elliot. The squadron flew from Garden City to New York and thence over all five boroughs. After the afternoon flight was over, three squadrons of five planes each hopped off from Mitchel Field and flew to Albany, where they gave an aerial demonstration over the state capitol. The airmen stayed at Albany over night and returned to Mitchel Field the following morning. During the day, the guests inspected the post at Mitchel Field and had lunch there.

In addition to the Army planes, the giant Remington-Burnelli, the first air freighter and the Sikorsky carried a number of the guests in the air. The flight was arranged by the members of the Aviation Committee of the Newspaper Club of New York. The members of the committee are: Harry A. Bruno, chairman; George T. Bye, Howard Mingos; Samuel Moore, Jack Binns, George Quisenberry, George W. Sutton, Jr., George Wheat, Francis J. Tietsort and Frank E. Bogart.

Radio and the Airplane

By Robert R. Aurand

On the afternoon of May 20, 1925, a man in Chicago talked to a man in an airplane, three thousand feet above the Air Service Technical School, Chanute Field, Rantoul, Ill., 115 mi. away, and the man in the airplane replied. Each heard the other distinctly. It is believed this performance set another record for a two-way conversation as available data indicates the farthest previous communication of this nature covered a distance of 70 mi.

The above exhibition was preliminary to a Radio Demonstration given by the Communications Department of the Air Service Technical School at a military tournament in Chicago, Ill., May 22 to 24. This demonstration amazed and convinced numbers of skeptics, military as well as civilian spectators and listeners, for it was pointedly illustrative of the practical application of radio telephony from aircraft to the ground and vice-versa.

Just as AVIATION in its issue of Sept. 8, 1924, in commenting on the first airplane broadcasting, Aug. 14 of that year, forecasts the airplane as an important link in the art of radio broadcasting, so the writer believes this present accomplishment presages drastic changes in that essence of modern strategy and tactics—Communication. Not only a positive but a vividly intimate word picture of actual battle conditions is assured, unhampered by the limitations of time and distance. Future generals, thirty thousand feet above the ground, directing their commands in conflict below, is more than probable.

All Governmental air activities, the Air Mail in particular, will be more than ever a thorough and reliable element of public economy or national defense with the adoption of telephonic equipment.

First Lieut. Lawrence P. Hickey, A.S., Director of the Department of Communication, Air Service Technical School, assisted by First Lieuts. Arthur L. Johnson, Charles H. Howard, Sec. Lieut. John G. Salsman, and Master Sergt. Hugh Inman, all of the Communications Department, collaborating with Sears-Robuck Broadcasting Station, WLS, were instrumental in the success of the demonstration.

Prior to actual operation several test missions to Chicago were made by members of the Department. The outlook at this time was rather gloomy since considerable difficulty, due to faulty shielding and interference from other Chicago broadcasting stations was encountered. Three or four days before the tournament, however, a successful test was made.

Mr. Peck, chief engineer of WLS, whose cooperation and enthusiasm was much appreciated, then started work on connecting the receiver to both the public address system at the Grant Park Stadium and to the radio studio at the Hotel Sherman. A switching arrangement was completed allowing one sitting in the Stadium, to either talk to the planes or listen in over the public address system.

On Tuesday, May 19, a plane from the Air Service Technical School flew over Chicago and carried on two-way communication with the Stadium. On this night WLS featured our program. During these flights considerable advertising for the meet was given.

The day following, the suggestion was advanced to try a long distance test. The plane departed with the intention of returning when either was unable to hear the other. Much to the surprise of both pilot and observer, upon reaching Chanute Field, the location of the Air Service Technical School, a distance of 115 mi. conversation was quite distinct both in the plane and at the ground station in Grant Park. Mr. Peck, who was at the receiving station, stated that everything was heard clearly on a loud speaker. Station WLS was re-broadcasting the airplane transmission during this period. A longer distance record could easily have been made but since a night test was due, the plane returned to Chicago.

The night's work was merely a repetition of the previous evening. It was, however, extremely difficult because of interference from numerous other stations. To overcome this obstacle, it was decided to use a forty foot antenna for reception purposes when operating in the vicinity of Chicago. At first this antenna was attached to the wing but was later placed in the rear cockpit of the plane. May 19th's program was repeated on Thursday.

Friday the meet started. A three ship formation was to be ground controlled. From all reports the mission was a success. However, the transmission and reception of messages was deemed too slow:—each sentence was repeated twice. Saturday, real, honest-to-goodness communication was established. Orders to the planes were given with great rapidity and were executed without delay. From the viewpoint of one in the Stadium this was a decided hit. There was no program Sunday afternoon, the tournament suspending activities because of inclement weather, but that night the three ship formation took off for Grant Park and successfully repeated their previous achievement.

Two DHM1 planes were used with ignition shielding, equipped with the SCR 134 transmitter and the superheterodyne receiver furnished with this set. The transmission was done at 600 KC, taken up by the ground receiving station at the Stadium, carried over the Bell telephone wires to WLS and from there broadcasted to the public. The set is easily operated, and the same one, in its entirety, was used from start to finish of the tournament. All flying was done from 1000 to 3000 ft.

Army Air Orders

Transfer of Sec. Lt. Eugene Barber Ely, A.S., to Field Art. announced. Lieutenant Ely relieved from duty Kelly Field, and ordered to Fort Sam Houston.

Maj. Douglas B. Netherwood, A.S., Washington, to Harvard Grad. Sch. Bus. Admin., Cambridge, for instruction.

U. S. NAVAL AVIATION

Airship Maneuvers

When the U.S.S. Shenandoah returns to Lakehurst from her flight to Bar Harbor, Me., tactical maneuvers will be undertaken with the battleship, U.S.S. Texas off the Atlantic coast. These operations will constitute important steps in the development of the airships as tactical units with the fleet. The Texas, the ship available for work with the Shenandoah is scheduled to go to a navy yard for overhaul on Aug. 1. This will necessitate the completion of joint operations between the two vessels prior to that date, and therefore the remainder of the month of July has been designated as the period for these joint maneuvers.

Flying conditions over the sea in the matter of temperature and freedom from thunder showers, at this time of the year are satisfactory, whereas the conditions in the interior of the country with frequent thunderstorms and varying temperatures make airship navigation inadvisable.

Upon the completion of the exercises with the Texas, the Shenandoah will have a long range radio outfit installed at Lakehurst and will make test flights to develop its operation.

During the latter part of August or the first part of September, depending upon the conditions, it is contemplated sending the Shenandoah to Minneapolis and other cities as originally scheduled for the Los Angeles. Details of this cruise will be announced later.

N.A.S., New York

The permanent detail of this station consists of Lieut. H. S. Kendall, U.S.N., commanding; Lieut. John W. Iseman, U.S.N. R.F.-6, executive; Eugene S. Rhoads, N.A.P., U.S.N., flight instructor; and eight enlisted men of various rating of the N.R.F. So far this year four students have completed the primary training course at this station, three of whom have been sent to Hampton Roads to finish their training there. They are: Erickson Perkins, Jr., Thomas B. Hoy, William E. Byrne and Malcolm Hathaway. There are five students under instruction at the present time. They are: Storm Archer, Joseph M. Weldon, William J. Junkerman, Karl Finsterbusch and Ward E. Pierce.

Oil Reserve Map

The most difficult aerial mapping project yet undertaken by Naval airplanes is now in progress, by planes from the Naval Air Station, San Diego, Calif., on an aerial photographic map of the Naval Oil Shale Reserves One and Three in western Colorado. The area to be mapped is in a rugged mountainous region, varying from eight thousand to over nine thousand feet in altitude above sea level. Located on the top of a plateau, and approachable only by faint trails winding up its almost sheer sides, Naval Oil Shale Reserve No. One will present the hardest problem in operation to the Naval fliers, and at the same time will bring out most strikingly the advantages in speed and accuracy that aerial mapping has over the older ground methods in surveying almost impenetrable mountain country. This Reserve consists of 36,550 acres, and is adjoined by Reserve No. Three which amounts to 22,600 acres. Thus the total territory to be covered from the air in one mosaic map will consist of nearly 60,000 acres, or over 92 sq. mi.

This work is in charge of Lieut. Comdr. W. H. Osgood, of the Office of the Secretary of the Navy. Under him there will operate three planes from the Naval Air Station, San Diego, Calif., in charge of Lieut. B. H. Wyatt, U.S.N., who is an experienced pilot for aerial survey work, having had experience in the aerial mapping of the California Oil Reserves. Cooperation in the preliminary ground work necessary before starting the survey, such as locating markers visible from the air to be used as check points when the map is constructed from the aerial photographs, has been accorded the Naval officers by Colorado officials of the Department of the Interior. Lieutenant Commander Osgood and Lieutenant Wyatt visited the scene of the aerial map work the first part of June. They located markers and found and made arrangements for the use of landing fields and photgraphic laboratories. The photographic negatives will be developed and the prints made in laboratories in Rifle and Grand Junction, Colo. The finished photographs will be turned over to the Interior Department for construction into a finished map.

After the mapping of the Oil Shale Reserves has been finished by the Naval planes, they will proceed to make an aerial survey of territory adjacent to the Reserves, for the Geological Survey. This area, some 190 sq. mi., will be surveyed from the air rather than mapped. The covering of this territory by Naval planes will enable the Geological Survey to fill in one more section of ordinarily inaccessible country in their rapidly growing geographic map of the United States. The cost of this last project, in the matter of films, paper and chemicals, will be borne by the Geological Survey.

This mapping of the Colorado Oil Shale Reserves will tax the ingenuity and resourcefulness of the Navy pilots and aerial photographers to the limit. With over one half of the area to be mapped at least 8,000 ft. above sea level, it will be necessary for the planes to fly at over 13,000 ft. in order to have a mapping altitude of 5,000 ft. The nearest landing field is at Rifle, Colo., 29 mi. to the east of the Reserves, and the 29 mi. are all over mountainous country. Upon dependability of engines and planes, and resourcefulness of pilots will hang the success of this undertaking. The planes to be used will be of the "DH-4B" type, a plane that has given faithful service under adverse conditions to the Air Mail, the Navy, the Marine Corps and the Army for the past six years. The maximum altitude of the DH-4B, with full load, including two men and a full supply of fuel and oil, is some 15,000 ft. so that the planes will have a margin of about 1,500 ft. The landing field at Rifle to be used by the planes is at present a cow pasture, but the owner has kindly consented to clear his stock off during the period the field will be used.

New Three Purpose Plane

The Navy Department has awarded a contract for three planes to the Douglas Co. of Santa Monica, Calif., for $229,500.

The contract is for three planes of a new design of three purpose airplane, for scouting, bombing and torpedo dropping powered with two 400 hp. air-cooled engines. This plane is a variation of the SC three purpose type now in quantity production for the Navy.

The twin-engined plane, to be known as the T2D, is convertible for use either as a landplane or as a twin float seaplane. Three of these planes are provided for in the contract with the Douglas Co. and upon delivery will be given tests under service conditions with the Naval Aircraft Squadrons at the Naval Air Stations. The T2D is a biplane, with both engines mounted on the lower wings as tractors. The plane will carry a crew of three and will be provided with a radio compartment.

This experimental development is another step in the fulfillment of a naval aircraft policy to produce multiple purpose types of airplanes for use with the fleet. By combining the functions of long distance scouting, bombing and torpedo dropping in one plane, as has been done in the SC type, the problems of operations and upkeep are simplified, as well as greater flexibility being obtained with the squadrons. The use of the "three purpose" planes will simplify the matter of spare parts and repair, and will result in more economical as well as more efficient operation.

Navy Air Orders

Ens. Murr E. Arnold det. U.S.S. Smith Thompson to temp. duty Nav. Air Sta., Pensacola.

Ens. Herbert M. Wescoat det. U.S.S. Smith Thompson, to temp. duty Nav. Air Sta., Pensacola.

Marine Air Orders

Sec. Lt. Evans F. Carlson det. N.A.S., Pensacola to Marine Bks., Nav. Oper. Base, Hampton Roads.

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PUBLISHER'S NEWS LETTER

"Don't travel by Airplane" is the sign that has literally been hung in the offices of the U. S. Shipping Board. In a General Order, employees of this government are directed "not to authorize in travel orders transportation by Aeroplane or to approve vouchers covering the cost of transportation by Aeroplane. All travel authorized should be by the most economical and usually travelled route." It further states that "The Fleet Corporation does not desire to recognize as a usual or customary means of transportation by its employees travel by Aeroplane." This order signed by Mr. L. C. Palmer, President of The Fleet Corporation gives an indication of how some of the water-wise government officials feel about air transport. Saving of time is not considered. Flying is taboo. This order should be filed in the government archives together with the stage coach directions to government employees not to use the expensive and dangerous railways, and the sailing ship devotees' prohibition against travel on steamships. It might also occupy a frame near the letter from the Patent Office stating that airplanes were not patentable as they were impracticable.

* * * *

Clinton W. Gilbert in his "Daily Mirror of Washington" gives such an excellent picture of the Government official who is being interviewed that it is reprinted here to save hot weather exertion. It applies with exceptionally faithful similarity to interviews generally on aviation subjects:

"I think you can judge a public official by the way he acts when a newspaper man approaches him. If he acts as if your ear were something to fill up with propaganda, beware of him; he is either a selfish person trying to gain a little self-advertising or a fanatic boosting some cause, which in all probability he identifies with himself. If he will not talk, it is because he has something to conceal; he is either cowardly or dishonest. If he is elusive, he is conscious of some weakness in himself. If he is too plausible, it is because he despises your intelligence, and the chances are that he despises the public's intelligence, too, and he is probably playing some game of his own. If he is too busy to talk, the chances are that he is a bad executive, and probably incompetent besides. If he has an overbearing manner, he is probably dishonest intellectually and may be dishonest in other ways, too. If he is overfriendly, trying to make you feel what a very good fellow he is, he is certain to be pulling your leg."

* * * *

"There is not anything that makes the average public man so self-conscious as a visit from the press. He feels instantly that he must be a great man. Or he think that he is speaking into the ear of the whole country. Or he is nervous and on guard lest somehow he betray himself. He delivers dicta to you from some incredible height or he condescends to your level, all smiles and paws upon the shoulder. The rare man is the one who can forget himself, talks to you man to man, with obvious enjoyment of the opportunity, never thinking how he can use you or how you may destroy him."

* * * *

At this time of the year when golf is uppermost in the minds of so many aircraft devotees, it is interesting to hear how golfers are using airplanes to get them to their courses. Some are even speculating as to the future growth of the game through the wider use of flying.

Now comes Charles Evans, Jr., with the thought that airplanes will take the place of automobiles in the annihilation of distance. "Golf owed much to the motor and developed with it. If it finds increased development with the airplane it will become the greatest sport in the world," wrote Chick recently. "In a small way we have already had much experience with airplanes and golf."

The former national champion then goes on to state how when returning from the national amateur at the Engineers Country Club in 1920—which event he won—he left the train at South Bend, Ind., where he was met by an airplane that carried him to Kokomo in time for a golf exhibition with Vardon and Ray. This same plane, through the courtesy of James C. Patten, brought Bob Macdonald and Evans to Chicago, landing the former metropolitan open champion at Bob o' Link and "Chick" on the eleventh fairway at Edgewater.

Kirkwood, too, was able to keep an important golf engagement by the use of an airplane when he missed his train. Last summer Evans was invited by T. Suffern Tailer to play in the gold mashie tournament at Newport, and Tailer suggested that Chick come to New York, where he would be met by a plane to carry him to the club.

"I was not able to go, but the suggestion shows what the airplane might be able to accomplish for golfers," said Evans. "I also recall its use in another sport, for in 1921 I was able to see the English Derby by a flight from Paris to London, landing there only a short time before the races began.

"I think the time will come when every golf club will have its landing place for the benefit of the players. Already there is a desire on the part of aviators to have landing fields near golf courses because in an emergency a golf course provides a safe spot for landing. Golf is a world game and the time may come when an enthusiastic player may mount his airplane and golf his way around the world."—L.D.G.

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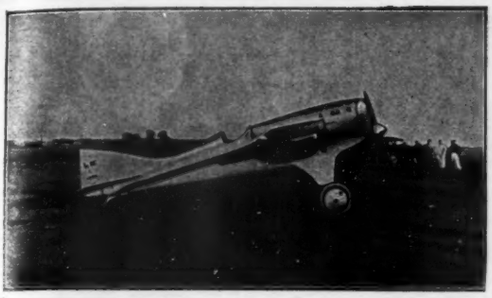

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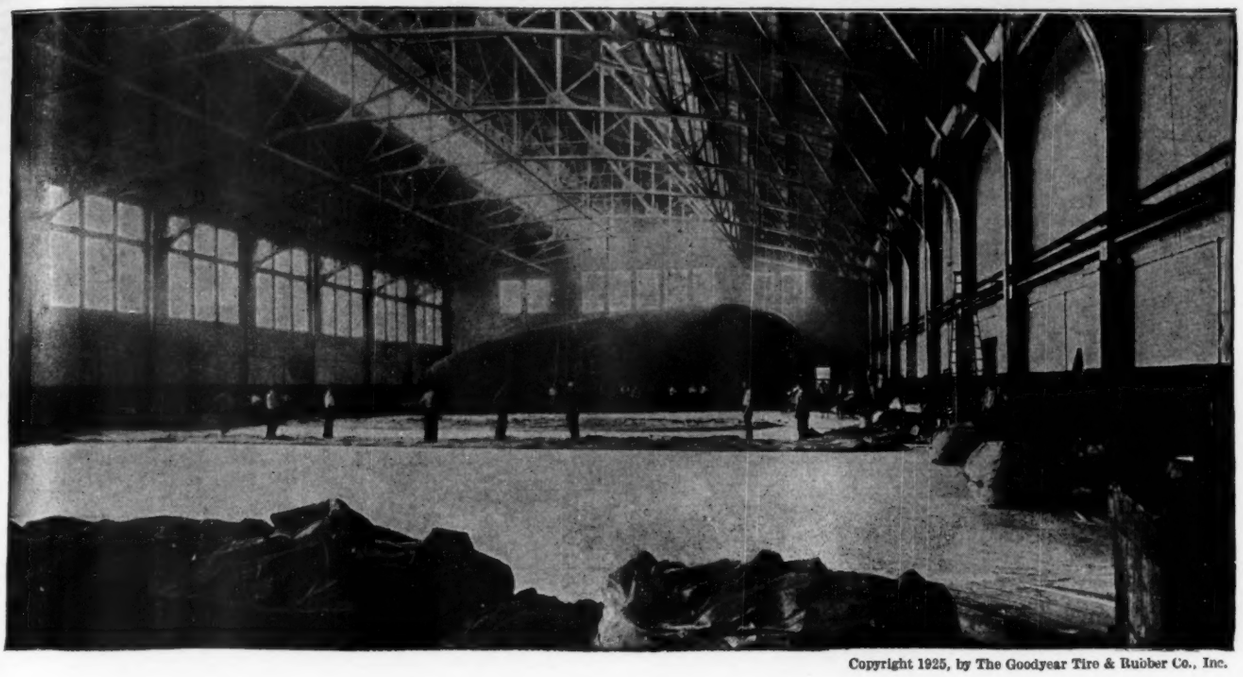

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Even before man had taken wing, Goodyear was learning how to make special rubber compounds for special service.

Rubber—like metals—must be prepared with a specific knowledge of the duty the finished product is to perform.

Goodyear knows the needs of aircraft, and aircraft builders. A corps of highly trained aeronautical experts maintains this knowledge by constant co-operation with airplane manufacturers.

Goodyear builds airships, and balloons, of every type and size, and makes everything in rubber for the airplane. Write Goodyear, Akron, Ohio, for any information you want.

The GOODYEAR-ZEPPELIN CORPORATION, *a subsidiary of The Goodyear Tire & Rubber Company, holds the U. S. patent and manufacturing rights of Luftschiffbau-Zeppelin, and is ready to build Zeppelin airships of advanced type for any requirement of commercial service or national defense*

GOODYEAR

AVIATION EQUIPMENT

16 of the WHIRLWIND engines are being used this year by Huff-Daland Dusters, Inc., in their dusting planes.

For flying close to the ground with heavy loads in small, tree-surrounded fields and with low operating costs, Huff-Daland Dusters, Inc., chose WHIRLWIND engines.

WRIGHT AIR-COOLED ENGINES DECREASE THE COST OF FLYING!

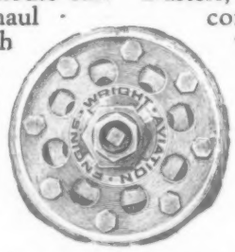
THROUGH four years of continual production with steadily improving manufacturing methods Wright 200 H.P. air-cooled engines have been brought to a point where the selling price is low as compared with *any type* of new gasoline engine and extremely favorable in the case of new *aviation* engines.

Nor is the reasonable first cost the only factor. The durability of the Whirlwind Engine has been sufficiently proved so that at least 300 hours can reasonably be anticipated without overhaul of any kind, and the facility with which inspection adjustments and minor repairs can be made without engine removal prevents the loss of valuable flying time.

The elimination of maintenance cost and danger liability of water radiation systems and the decrease in cost of spare parts due to the unit construction of the engine add still other factors to the decreased cost of flying.

Peru, Brazil, Cuba, Canada and other foreign governments are using Wright Whirlwind Engines. The commercial possibilities of these engines are exemplified in the recent installation of sixteen Whirlwind Engines in the planes of Huff-Daland Dusters, Inc., Georgia, who are taking important contracts for fruit tree and cotton boll weevil dusting. Impartial aeronautical and industrial engineers have decided that a considerable saving can be made by using air-cooled engines.

Bulletin No. 8-A containing a general description and technical information will be forwarded on request.



WRIGHT AERONAUTICAL CORPORATION

Paterson, New Jersey, U. S. A.

WRIGHT AIR-COOLED ENGINES

J-4, 200 H.P. WHIRLWIND